

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:  
a semiconductor chip comprising a magnetic  
element;

5 an enclosure which seals the magnetic chip; and  
substantially spherical magnetic substance  
particles which are interspersed in the enclosure.

2. A semiconductor device comprising:  
a semiconductor chip comprising a magnetic  
10 element;

an enclosure which seals the magnetic chip and  
which has a base material and a cap material joined  
together via a sealing material; and

15 a magnetic film provided on a chip side surface of  
the base material and on an inner surface of the cap  
material so as to surround the semiconductor chip.

3. The semiconductor device according to claim 1,  
wherein the enclosure is a plastic package or a ceramic  
package.

20 4. The semiconductor device according to claim 2,  
wherein the enclosure is a ceramic package.

5. The semiconductor device according to claim 3,  
wherein the plastic package contains an epoxy resin or  
a silicone resin.

25 6. The semiconductor device according to claim 3,  
wherein the ceramic package contains at least one of  
 $\text{Al}_2\text{O}_3$ ,  $\text{AlN}$ , and  $\text{BeO}$ .

7. The semiconductor device according to claim 4, wherein the ceramic package contains at least one of  $\text{Al}_2\text{O}_3$ ,  $\text{AlN}$ , and  $\text{BeO}$ .

8. The semiconductor device according to claim 1,  
5 further comprising a lead frame, and

wherein the lead frame has:

a die pad on which the semiconductor chip is mounted;

an inner lead portion sealed by the enclosure; and  
10 an outer lead portion led out of the enclosure.

9. The semiconductor device according to claim 2, further comprising a lead frame, and

wherein the lead frame has:

a die pad on which the semiconductor chip is  
15 mounted;

an inner lead portion sealed by the enclosure; and  
an outer lead portion led out of the enclosure.

10. The semiconductor device according to claim 8, wherein the inner lead portion of the lead frame has  
20 a stacked structure in which a plurality of conductive layers are stacked via insulating layers, and the plurality of conductive layers are electrically connected to corresponding external connection electrodes on the semiconductor chip by bonding wires.

25 11. The semiconductor device according to claim 9, wherein the inner lead portion of the lead frame has a stacked structure in which a plurality of conductive

layers are stacked via insulating layers, and the plurality of conductive layers are electrically connected to corresponding external connection electrodes on the semiconductor chip by bonding wires.

5           12. The semiconductor device according to claim 1, wherein the magnetic element is a tunnel magneto-resistance element.

          13. The semiconductor device according to claim 2, wherein the magnetic element is a tunnel magneto-  
10           resistance element.

          14. The semiconductor device according to claim 1, wherein each magnetic substance particle contains at least one of an insulator, an oxide, and a ferrite.

          15. The semiconductor device according to claim 1, wherein each magnetic substance particle has a diameter  
15           of 20  $\mu\text{m}$  or less.

          16. The semiconductor device according to claim 1, wherein the magnetic substance particles occupy 1 wt% or more of the enclosure.